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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,073	03/25/2004	Christopher Parks	87135PCW	6988

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Pamela R. Crocker
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER

WANG, KENT F

ART UNIT	PAPER NUMBER
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2622

MAIL DATE	DELIVERY MODE
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12/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/809,073

Applicant(s)

PARKS, CHRISTOPHER

Examiner

Kent Wang

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10, 12, 14-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 10, 12, 14-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendments, filed on 09/17/2007, have been entered and made of record. Claims 10, 12, 14-22 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 10, 12, and 14-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 10, 12, 14-15, 17, and 19-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by Komiya, US 5,335,075.

Regarding claim 10, Komiya discloses a camera (an electronic camera) comprising:

- an image sensor (a charge modulation device CMD 39, Fig 20) comprising a plurality of pixels in which at least two or more pixels have a charge control structure (condition setting circuit 64, Fig 20) used to change charge capacity during an integration time (col. 12, lines 27-54);

- wherein at substantially a beginning of the integration time the charge capacity is altered to substantially zero (at time 0 the reset is carried out to start the accumulation of charges, Fig 21) by either the charge control structure (condition setting circuit 64) or a read-out mechanism (CMD driving circuit 41, Fig 20) and the charge capacity is changed by the charge control structure (condition setting circuit 64) throughout the integration time (exposure time) such that substantially no portion of the pixel photo response curve is substantially linear (accumulation data is nonlinear as represented by F_0 in Fig 22) (col. 15, lines 21-41); and
- means for multiplying each pixel by a constant value (linear conversion circuit 88, Fig 20) determined for that pixel to compensate for variations of the charge capacity such that all pixel photo response curves are substantially equal (nonlinear accumulation data F_0 is converted to be linear as shown by F_1 in Fig 22) (col. 15, lines 21-41).

Regarding claim 12, Komiya discloses the charge capacity control structure (condition setting circuit 64, Fig 20) is pulsed so as to substantially reproduce the photo response curve (when time t_2 has passed, the signal is read out and reset is performed) (col. 14, line 67 to col. 15, line 10).

Regarding claim 14, Komiya discloses a look up table ("five readouts are performed when data accumulated at the accumulator" gave implicit that a table is inherent in the system) to translate the photo response curve into linear space for color filter processing

(nonlinear accumulation data F_0 is converted to be linear as shown by F_1 in Fig 22) (col. 15, lines 21-41).

Regarding claim 15, Komiya discloses the constant values are stored in a digital camera (for mode B of photographing mode, the number of accumulations is kept at a constant value n_C) (col. 9, line 55 to col. 10, line 12).

Regarding claim 17, Komiya discloses the image sensor (a charge modulation device CMD 39, Fig 20) is disposed in a digital camera that includes a mechanism (linear conversion circuit 88) to switch between linear and nonlinear photo response (nonlinear accumulation data F_0 is converted to be linear as shown by F_1 in Fig 22) (col. 15, lines 21-41).

Regarding claim 19, this claim differs from claim 10 only in that the claim 10 is an apparatus claim whereas claim 19 is a method. Thus the method claim 19 is analyzed and rejected as previously discussed with respect to claim 10 above.

Regarding claims 20, 21, and 22, these claims recite same limitations as claims 14, 12, and 15, respectively. Thus they are analyzed and rejected as previously discussed with respect to claims 14, 12, and 15 above.

Claim Rejections - 35 USC § 103

5. Claims 16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Komiya in view of Juen, US 5,341,220.

Regarding claim 16, Komiya discloses an image sensor comprising a charge control structure used to change charge capacity during the integration time. Komiya does not

disclose the capacity control structure is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure.

Juen discloses the capacity control structure (vertical overflow drain structure) which is adjusted to produce the desired photo response curve substantially entirely within the duration of a flash lamp exposure (flash light unit 13 is made ready to emit light) (col. 8, line 64 to col. 9, line 13, Juen).

Komiya and Juen are analogous art because they are from the same field of time integrating image sensors. At the time of the invention, it would have been obvious to a person of the ordinary skill in the art to use Juen's flash light unit in Komiya's image sensor device. The suggestion/motivation would have been to enable the system to provide an auxiliary illumination in case of need during the entire duration of flash lamp exposure (col. 5, lines 16-21, Juen).

Regarding claim 18, , the limitations of claim 10 are taught above, the Komiya reference does not specifically teach that CCD in which images are substantially read out of a vertical CCD before starting the integration in photodiodes of any next images. However Juen does teach the image sensor as a CCD in which images are substantially read out of a vertical CCD (vertical transfer register 44, Figs 4-5) before starting the integration in photodiodes of any next images (col. 13, lines 24-37, Juen).

Thus, it would have been obvious to one of ordinary skill in the art to have included the image sensor as taught by Juen into Komiya's image sensing apparatus, as to make it possible to accurately measure only the very small photo current flowing out from the photoelectric charge storage layer (col. 13, lines 52-59, Juen).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kindt et al. (US 6,348,681) disclose a method and circuit for setting breakpoints for active pixel sensor cell to achieve piecewise linear transfer function.
- Lee et al. (US 6,600,471) disclose providing a precise MOS imager transfer function control for expanded dynamic range imaging.
- Bowlby et al. (US 5,929,904) disclose providing a methods and apparatus for obtaining nonlinear responses from photodetector arrays.

- Van De Steeg (US 4,849,814) discloses a charge-coupled device having overexposure control.
 - Sakai et al. (US 4,845,566) disclose a solid-state image pickup apparatus having controllable means for eliminating surplus charge.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc Yen Vu can be reached on 571-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-270-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KW
23 November 2007


NGOC YEN VU
SUPERVISORY PATENT EXAMINER